

and a transmigration into heaven, even whilst we remain here upon earth in the flesh, and a descending or penetrating into the center and innermost recesses of the earth, and all earthly bodies; nay, it would open not only a cranny, but a large window (as I may so speak) into the Shop of Nature, whereby we might be enabled to see both the tools and operators, and the very manner of the operation it self of Nature; this, could it be effected, would as far surpass all other kind of perspectives as the vast extent of Heaven does the small point of the Earth, which distance it would immediately remove, and unite them, as 'twere, into one, at least, that there should appear no more distance between them then the length of the Tube, into the ends of which these Glasses should be inserted: Now, whether this may not be effected with parcels of Glass of several densities, I have sometimes proceeded so far as to doubt (though in truth, as to the general, I have wholly despair'd of it) for I have often observ'd in Optical Glasses a very great variety of the parts, which are commonly called Veins; nay, some of them round enough (for they are for the most part, drawn out into strings) to constitute a kind of *lens*.

This I should further proceed to open, had any one been so inquisitive as to have found out the way of making any transparent body, either more dense or more rare; for then it might be possible to compose a Globule that should be more dense in the middle of it, then in any other part, and to compose the whole bulk, so as that there should be a continual gradual transition from one degree of density to another; such as should be found requisite for the desired inflection of the *transmigrating* Rays; but of this enough at present, because I may say more of it when I set down my own Trials concerning the melioration of *Dioptricks*, where I shall enumerate with how many several substances I have made both *Microscopes*, and *Telescopes*, and by what and how many, ways: Let such as have leisure and opportunity farther consider it.

The next Quarry shall be, whether by the same collection of a more dense body then the other, or at least, of the denser part of the other, there might not be imagin'd a reason of the apparition of some new fix'd Stars, as those in the Swan, *Cassiope's Charr*, *Serpentarius*, *Piscis*, *Cetus*, &c.

Thirdly, Whether it be possible to define the height of the *Atmosphere* from this inflection of the Rays, or from the Quicksilver Experiment of the rarification or extension of the Air.

Fourthly, Whether the disparity between the upper and under Air be not sometimes so great, as to make a reflecting superficies; I have had several Observations which seem to have proceeded from some such cause, but it would be too long to relate and examine them. An Experiment, also somewhat analogous to this, I have made with Salt-water and Fresh, which two liquors, in most Positions, seem'd the same, and not to be separated by any determinate superficies, which separating surface yet in some other Positions did plainly appear.

And if so, Whether the reason of the equal bounding or *terminus* of the under parts of the clouds may not proceed from this cause; whether, secondly,

secondly, the Reason of the apparition of many Suns may not be found out, by considering how the Rays of the Sun may so be reflected, as to describe a pretty true Image of the body, as we find them from any regular Superficies. Whether also this may not be found to cause the apparition of some of those *Parelii*, or counterfeit Suns, which appear coloured, by refracting the Rays so, as to make the body of the Sun appear in quite another place then really it is. But of this more elsewhere.

5. Whether the *Phænomena* of the Clouds may not be made out by this diversity of density in the upper and under parts of the Air, by supposing the Air above them to be much lighter then they themselves are, and they themselves to be yet lighter then that which is subjacent to them; many of them seeming to be the same substance with the Cobwebs that fly in the Air after a Fog.

Now that such a constitution of the Air and Clouds, if such there be, may be sufficient to perform this effect, may be confirm'd by this Experiment.

Make as strong a Solution of Salt as you are able, then filling a Glass of some depth half full with it, fill the other half with fresh Water, and poise a little Glass-bubble, so as that it may sink pretty quick in fresh Water, which take and put into the aforesaid Glass, and you shall find it to sink till it comes towards the middle, where it will remain fixt, without moving either upwards or downwards. And by a second Experiment, of poising such a bubble in water, whose upper part is warmer, and consequently lighter, then the under, which is colder and heavier; the manner of which follows in this next Quarry, which is,

6. Whether the rarification and condensation of Water be not made after the same manner, as those effects are produc'd in the Air by heat; for I once pois'd a seal'd up Glass-bubble so exactly, that never so small an addition would make it sink, and as small a detraction make it swim, which suffering to rest in that Vessel of Water for some time, I alwayes found it about noon to be at the bottom of the Water, and at night; and in the morning, at the top: Imagining this to proceed from the Rarification of the Water, caus'd by the heat, I made tryal, and found most true; for I was able at any time, either to depress, or raise it, by heat and cold; for if I let the Pipe stand for some time in cold water, I could easily raise the Bubble from the bottom, whither I had a little afore detruded it, by putting the same Pipe into warm Water. And this way I have been able, for a very considerable time, to keep a Bubble so poys'd in the Water, as that it should remain in the middle, and neither sink, nor swim: For gently heating the upper part of the Pipe with a Candle, Coal, or hot Iron, till I perceived the Bubble begin to descend, then forbearing, I have observed it to descend to such or such a station, and there to remain suspended for some hours, till the heat by degrees were quite vanish'd, when it would again ascend to its former place. This I have also often observed naturally performed by the heat of the Air, which being able to rarifie the upper parts of the Water sooner then the lower, by reason of its immediate contact, the heat of the Air has